WALL CAVITY DRAIN PANEL

Background of the Invention

This invention relates to brick walls and insulating panels and more particularly to maintaining water flow from a cavity behind a brick wall through weep holes in brick courses defining a brick wall.

A brick wall structure typically includes a veneer or facing of bricks laid in elongated courses outside of an interior or subwall of concrete block, of framing with insulating sheathing, or the like. Typically, the brick wall is set on a base, or on a flashing on a base, with bricks held together by mortar between adjacent bricks and between brick courses. A cavity is defined by weep holes between side-by-side bricks in a lower course, for example, and water finding its way into the cavity is anticipated to drain outwardly through these weep holes.

The problem is that the weep holes can clog. Water can back up in the cavity, causing mold, odor, damage or other nasty results. The clogging of weep holes can be produced by a number of agencies, can cause weep hole clogging, primarily among them is mortar dropped from the setting process of laying one brick course on top of another. Excess mortar falls down the rear or interior surface of the brick wall and can clog the inlets of the lower weep holes.

A variety of solutions have been proposed to prevent weep hole clogging by mortar droppings. See, for example, only United States Patents Nos. 5,343,661; 5,230,189; Re. 36,676; 6,0234,892; 5,937,594; 6,112,476 and 5,598673. In several of these, open cell or filamentatious bodies are inserted into the cavity between the bricks and the subwall; the "bodies" may have particularly shaped top surfaces and are placed without fixation devices, rest freely on the wall base, or have a thickness the same as the cavity width.

Such systems require the insertion then of a separate member or "body" into the cavity and must be supplied as a separate building element. Moreover, there is no uniform procedure by which weep holes in upper floors, levels or courses can be protected.

Accordingly, it has been one objective of the invention to improve the protection of weep holes in a brick wall from mortar clogging.

A further objective of the invention has been to provide improved brick wall structure to facilitate weep hole drainage.

A further objective has been to provide an improved apparatus for reducing or preventing weep hole clogging in brick walls.

A yet further object of the invention has been to provide improved methods of controlling water flow through weep holes in a course of bricks defining a brick wall and from a cavity defined between a brick wall and an interior wall.

Summary of the Invention

To these ends, a preferred embodiment of the invention contemplates an improved dual-function panel for disposition in a wall cavity wherein the panel is manufactured of an insulative material such as foam. The panel has a grooved face over which is disposed a water permeable fabric attached to the face. Insulating panels having these features are available from T. Clear Corporation of Hamilton, Ohio under their brands "Therma-Dry" and "ThermaCav". In addition, however, the panels are improved from the water control goals of this invention by having a lower edge of the fabric not attached to the panel and being extensible therefrom. To such an extensible portion is secured a preferably flexible, water permeable matrix.

In use, such panels form an insulating sheathing or panel exterior of a subwall of concrete block, for example, but interior of and spaced from the interior side of the brick wall to define, or reside in, a cavity. The lower edge of fabric is extended away from the panel, across the cavity

toward the brick wall, then upwardly along a course of bricks above or over weep holes formed in or under a brick course.

Thus, the fabric is flexed into a "U"-shaped channel above any wall base and along the cavity at its lower end. The matrix is attached to the fabric proximate the attachment of the fabric to the insulating panel, extends across the cavity with the fabric, and upwardly with it parallel to the rear surface of the brick wall. The matrix thus extends across the cavity and is flexed about ninety degrees upwardly in water-passing support of the fabric channel. A mortar catching channel is thus formed, catching any mortar falling off a brick course and stopping it before it can clog the inlet of a weep hole covered or under the laminate of fabric and matrix.

Water can then pass through the fabric and matrix onto the cavity base or any flashing at the base, and out unclogged weep holes under or in a brick course. In addition, water in the cavity can flow through the fabric, down through grooves in the panel face behind the fabric, or onto the base or flashing, with mortar droppings retained by the above fabric and matrix laminate extending across the cavity.

In addition to the benefits of maintaining the weep holes free of mortar clogging, another significant benefit of this invention is the provision of the water flow controlling structure as described, together with an insulating panel used in a building process so no additional inserts, mats or other special forms are required. In particular, a contractor only needs to set the insulating panels with extensible fabric and matrix as desired, then fold the fabric and matrix laminate up along the

rear surface of one of the early brick courses. In this way, an insulated brick wall structure is provided with the advantage of prevention of weep hole clogging by mortar droppings and without the need for other special inserts, mats or the like.

These and other objects and advantages will become readily apparent from the following detailed written description and from the drawings in which:

Description of the Drawings

Fig. 1 is an illustrative cross-sectional view of a brick cavity wall showing the invention;

Fig. 1A is a perspective drawing of the rear surface of a lower course of bricks in the wall of Fig. 1;

Fig. 2 is an enlarged view of the lower portion of Fig. 1; and

Fig. 3 is a perspective view of a wall cavity drain panel according to the invention as also shown in Figs. 1 and 2 but with a portion of the fabric and matrix peeled back for clarity.

Turning now to the drawings, there is shown in Figs. 1 and 2 a brick cavity wall structure 10 defined by a brick wall 11, a subwall 12 which, as shown in one embodiment, is a concrete block wall, and a cavity 13 defined therebetween. As shown in Fig. 1, brick wall 11 is itself defined by a plurality of brick "courses", i.e. single layers of end-to-end bricks, 15-23, set on top of one another from the lower course 15 and so on as high as the wall 11 may be.

In a lower course of bricks 15, preferably a plurality of weep holes 25 are formed, either in the bricks or defined by lateral spaces between the bricks of course 15. These weep holes have an inlet communicating with cavity 13, and extend outwardly so water can flow (arrow A) from cavity 15 through the holes to the exterior of the wall 10 at 25a as shown in Fig. 1A.

Concrete block wall 12 is defined by courses 26-28, and so on, of concrete blocks.

Brick wall 11 and subwall 12 rest on a base 32 of concrete or any other suitable material.

Bricks in the courses 15-23 are set in mortar, such as mortar 34 between the courses, while the concrete blocks defining subwall 12 can also be set in mortar such as at 35.

A brick wall tie 37 is extended outwardly into cavity 13 from mortar 35 between concrete block courses 27, 28, for example. A wall tie 38 extends into cavity 13 from mortar 34 between brick courses 20, 21, for example, and is operably connected to tie 37 in any suitable fashion to facilitate stability of brick wall 11. As many ties 37, 38 as are needed are used.

A bracket end 39 extends downwardly from tie 37 as shown in Fig. 1, and as will further be described.

An elongated flashing 41, shown in Figs. 1 and 2 has a vertical section 42 extending upwardly along block course 26, and a horizontal section 43 extending from block course 26 outwardly on base 32 under lower brick course 15. Flashing 41 helps to direct water outwardly of any wall structure 10.

As illustrated in Figs. 1, 1A and 2, mortar 34a, under brick course 15, lies on flashing 41 and is somewhat mashed or compressed by bricks thereon so it extends behind brick course 15 into cavity 13. When mortar 34b and 34c then is applied, as the courses are set, such mortar (as at 36) tends to drop down behind lower brick courses, into cavity 13 and toward or onto flashing 41 or onto base 32 in the absence of flashing. Without the use of the wall cavity drain panel of this invention, and to be described, mortar 34a, 34b and 34c, for example, can fill up or clot inlets from cavity 13 into weep holes 25.

Turning now to drain panel 50, according to the invention, its overall features are perhaps best seen in Fig. 3. Panel 50 includes an insulating member 51, preferably of suitable insulating foam such as extruded polystyrene having a plurality of vertical grooves 52 and horizontal grooves 53 therein. Fig. 3 illustrates only a small portion of a panel 50,it being understood that such panels can be relatively larger, for example, two to four feet in vertical dimension and six to eight feet in horizontal dimension, or any other suitable size.

Grooves 52, 53 define blocks, such as at 55, 56, for example, therebetween and these blocks have faces 57 defining an outwardly directed face of insulating member 51.

Extending on member 51 and on some of the faces 57 is a flexible, water-permeable fabric 60 preferably of non-woven synthetic material of any suitable manufacture, although woven material could be used.

Fabric 60 is preferably adhered to faces 57 of member 51 by any suitable adhesive or bonding process, and excepting the last two or three rows of blocks or faces 57 disposed at what will be the lower margin or edge 58 of panel 50. In Fig. 3, the fabric 60 is curled backwards at 61 to illustrate the noted construction. It will thus be appreciated that fabric 60 is extensible away from member 51 and can be flexed into a U-shaped or channel-like configuration as shown in the drawings.

A matrix 66 is attached to an inner face 62 of fabric 60. Matrix 66 is open and water-permeable and can be of any suitable material such as a randomly deposited or applied filamentary synthetic. Matrix 66 is generally stiffer than fabric 60, but rains flexible. It is adhered to fabric 60 in any suitable manner, such as by adhesives, heat bonding or the like.

Returning to Figs. 1 and 2, a panel 50 is shown oriented in cavity 13 between brick wall 11 and concrete block subwall 12. In this configuration, panel 50 rests on or close to flashing 41 at the bottom of cavity 13. Nevertheless, neither the fabric 60 nor matrix 66 touch or approach flashing 41 or base 32.

Instead, the fabric 41 is folded into a "U" or channel-like shape as shown so to extend outwardly from member 51, across cavity 13 and then upwardly proximate a rear wall of the bricks in wall 11. Matrix 66 also extends across cavity 13, and upwardly against the backside of bricks in wall 11 and more particularly in this embodiment up along the back surface of bricks in lower course 15.

At the same time, the fabric and matrix define in part a catch trough for any mortar droppings 36 which fall into cavity 13 from between the higher brick courses 16-23, etc.

Since the fabric 60 and matrix 66 extend across inlets into weep holes 25 (such as at 31 in Fig. 2, for example) , the inlets are thus protected and the fabric 60 and matrix 66 serve to prevent intrusion of clogging mortar into weep holes 25.

Thus, water W (Fig. 2) in cavity 13 filters through fabric 60 on member 51 into grooves 52, 53 and downwardly as indicated by the arrows. At the bottom 58 of panel 50, water flows onto flashing 41, onto mortar 34a and into weep holes 25 from where it escapes outwardly of brick walls 11, as shown by arrow A, through weep hole outlet 25a..

The catch trough provided by fabric 60 and matrix 55 prevents mortar droppings 36 from falling to the cavity bottom and blocking water flow. Yet water is free to flow through fabric 60 and matrix 66 to the bottom of cavity 13 and out weep holes 25.

A few other structural details are of interest. For example, a number of panels 50 may be used end-to-end for long walls. Other drain panels such as at 70 could be used on top of lower panels 50, but the extended fabric 60 and matrix 66 is not necessary for these.

In this regard, note that bracket leg 39 holds the top of panel 50 in position in cavity 13, preventing its forward tilt. Likewise, bend 40 in tie 38 keeps the bottom edge 71 of upper panels 70 from scooting outwardly in cavity 13, and so on.

Multiple floors can each have a flashing and a lower panel 50, if desired at those floor breaks.

While the drawings show fabric 60 extending away from panel member 51 at the lower-most face 57, the blocks 55, 56 may extend down to lower edge 58 of panel member 51, with fabric 60 not adhered to the lower faces 57.

Moreover, even if cavity 13 is wholly filled with mortar, water can still egress from cavity 13 via grooves 52, 53 and weep holes 25.

While fabric 60 and matric 66 can be of any suitable manufacture, one form of suitable fabric is made by Reemay Inc. of Old Hickory, Tennessee, under product designation Typar® and one suitable matrix 66 is made by Keene Building Products of Mayfield Heights, Ohio, under product designation DriWall Rainscreen.

In this way, there are no special inserts, bodies or other structures required to maintain drainage from a cavity wall. The wall is simply insulated, but with a particular form of lower panel 50, then a mortar catch trough formed easily by the extensible fabric and matrix extensible across the cavity and upwards at least on the lower brick course, or higher. Weep holes so protected do not clog and drainage is secured.

These and other modifications and alternative embodiments will be readily apparent to one of ordinary skill in the art without departing from the scope of the invention and applicant intends to be bound only by the claims appended hereto.